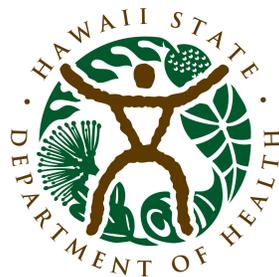


REUSE GUIDELINES

Volume II: Recycled Water Projects



Prepared by
Hawai'i State Department of Health
Wastewater Branch



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A. Introduction

The Department of Health (DOH) has long been an advocate for the use of recycled water provided that public health and water resources are not compromised. Use of recycled water has become more significant due to the state's growing population, limited potable water resources, and wastewater disposal issues.

Since increasing the safe use of recycled water will help meet the state's growing water needs, the *Guidelines for the Treatment and Use of Recycled Water* (now referred to as the *Reuse Water Guidelines*) have been revised to streamline the application process and update requirements.

The *Reuse Guidelines* consists of two volumes:

- **Volume I: *Recycled Water Facilities*** addresses technical requirements that must be met for the various qualities of recycled water as well as requirements to construct or modify a wastewater reclamation facility (WWRF).
- **Volume II: *Recycled Water Projects*** covers the application process to use recycled water for purposes such as irrigation, dust control, cleaning, and fire-fighting and establishes best management practices that apply to the end user.

B. Summary of Approval Process

Following is a summary of the approval process for a project intending to use recycled water:

1. **Recycled Water Purveyor:** The intended user should first find a recycled water purveyor to meet his recycled water needs. Following that, the appropriate application form should be completed and submitted to the DOH.
2. **Application Forms:** For a project in an area where use of recycled water is not restricted, the appropriate application form to submit depends on the intended use of the recycled water. Following are various recycled water application forms:
 - a. General Irrigation
 - b. Agricultural Irrigation
 - c. Non-Irrigation Use
 - d. Temporary R-1 Use
 - e. Construction Extension

3. **Application Submittal:** If required, the completed application should first be submitted to the applicable county purveyor. After receiving county approval, the application should be submitted to the DOH.
4. **Approval to Construct:** Once the application is reviewed and deemed satisfactory, the DOH will issue an approval to construct. When construction of the project is substantially complete, the applicant should provide at least two weeks' notice to the DOH to conduct an inspection.
5. **Approval to Use:** DOH will then inspect the project for compliance with requirements. If acceptable, an approval to use will be issued.

C. Definitions

"Adequate Buffer" means a buffer for spray irrigation that can be achieved by a separation distance of 500 feet; a physical barrier such as a wall or cliff; tall and dense vegetation; or irrigating with potable water within the 500 foot buffer zone.

"Agricultural Irrigation" means irrigation used to plant, cultivate, grow and/or produce plants and crops to provide food, fiber, lumber, biofuel, and medicinal, horticultural, floricultural or aesthetic products.

"Approved Use Area" means a site with well-defined boundaries where recycled water use has been approved by the DOH, in accordance with these guidelines and Chapter 62 of the Hawaii Administrative Rules.

"Best Management Practices (BMPs)" mean the most effective and practicable activities, conduct prohibitions, treatment requirements, schedules, maintenance procedures and other practices to minimize pollution, control runoff, ponding, spills, leaks, sludge or waste disposal, and public contact with recycled water, spray, or mist.

"Cross-Connection" means an actual or potential unprotected connection between a water system used to supply water for drinking purposes and any source or system containing water that is not approved for drinking or a substance that is not or cannot be designated as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover devices, and other temporary or permanent devices through which, or because of which backflow could, occur are considered to be cross-connections.

"Disinfection" means a process which inactivates or removes pathogenic organisms in water by chemical or physical means.

"DOH" means the Hawaii State Department of Health.

"Drip Irrigation" means application of water from emitters (either on the surface or subsurface) that are part of the piping system situated alongside the plants or turf to be irrigated and that discharge at a rate not to exceed 2 gallons per hour per emitter.

"Emitter" means a flow control device which applies water at a single point without a spray or jet.

"Evapotranspiration" means the process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants.

"Filter" means a unit for carrying out the filtration process, consisting of both the filter medium and its housing.

"Food crop" means any crop intended for human consumption.

"Groundwater" means water located underground in the zone of saturation that moves freely to points of discharge (e.g., springs) and withdrawal (e.g., wells and tunnels). Groundwater includes water impounded by dikes, perched on geologic strata or low permeability, or floating upon and displacing salt water. It includes water which comes from artesian and non-artesian sources, as well as the subflow of streams and underground streams.

"HAR" means the Hawaii Administrative Rules.

"Hose Bib" means a faucet or similar device to which a common garden hose can be readily attached.

"Industrial Cooling" means cooling of material or air for industrial purposes, but excludes air conditioning used for human comfort.

"Irrigation" means the intentional application of water for purposes of sustained plant growth.

"Landscape Impoundment" means an impoundment where recycled water is stored and used for aesthetic purposes such as landscape irrigation, where public contact with recycled water is not intended.

"Mist" means water droplets suspended in air, that are visible to the eye and that fall more slowly than rain.

"Non-potable" means not suitable for drinking by humans.

"Overspray" means recycled water which is transmitted through the air to a location other than where the direct application of recycled water is intended.

"Owner" means the owner of the entity receiving the recycled water, and does not refer to the property owner.

"Pathogen" means any agent, especially a microorganism, capable of causing disease.

"Person" means any individual, partnership, firm, association, public or private corporation, the State or any of its political subdivisions, trust estate or any other legal entity (the same as defined in section 342D-1, HRS).

"Ponding" means retention of recycled water on the ground or man-made surface for two hours or more following the cessation of an approved recycled water use activity.

"Potable" means suitable for drinking by humans.

"Purveyor" means one who sells or conveys recycled water to an end user, or to an intermediary other than a public or private entity providing water service.

"Recycled Water" means treated wastewater intended for use for a beneficial purpose.

"Recycled Water System" means the user's recycled water distribution system, including all pipes, hoses, distribution lines, storage components, re-pressurization systems, pumps, emitters, sprinkler heads, and other related components.

"Reclamation or Treatment facility" means an arrangement of devices, structures, equipment, processes and controls which produces recycled water suitable for its intended use.

"Restricted Recreational Impoundment" means a body of recycled water in which recreation is limited to fishing, boating and other non-body-contact water recreational activities.

"R-1" means recycled water where the wastewater has undergone oxidation, filtration and disinfection. R-1 is considered the highest grade of recycled water.

"R-2" means recycled water where the wastewater has undergone oxidation and disinfection.

"R-3" means recycled water where the wastewater has undergone oxidation only.

"Runoff" means flow of water along the surface of the ground or other natural or manmade surfaces, including but not limited to pedestrian walkways, streets, playground surfaces, and grassy slopes.

"Spray Irrigation" means application of recycled water to crops to maintain vegetation or support growth of vegetation by spraying it from sprinklers, micro-sprinklers or orifices in piping.

"Storage" when pertaining to water can consist of two types:

"Open water storage" means aboveground water storage exposed to the atmosphere, including ponds and open tanks.

"Closed water storage" means water storage that is not exposed to the atmosphere, including enclosed underground and aboveground units.

"Subsurface Drip Irrigation" means application of recycled water at least 4 inches below the finished grade, by discharging it from orifices in piping.

"User" means any person, firm, corporation, association, agency or customer receiving recycled water service.

"Wastewater Branch" means the DOH branch that may receive, review, and approve certain documents concerning wastewater reclamation facilities and recycled water projects.

Address: Hawaii Department of Health
Wastewater Branch
919 Ala Moana Blvd. # 309
Honolulu, HI 96814

"Wetted Area" means the surface area wetted at completion of irrigation.

D. Suitable Uses

Suitable use of recycled water depends on its quality and application method. Following are suitable uses for R-1, R-2, and R-3 recycled water. The DOH may deem other uses suitable on a case-by-case basis.

1. R-1 Suitable Uses:

- a. Irrigation: All landscape and agricultural irrigation via spray, surface drip or subsurface drip irrigation.
- b. Homes: Irrigation of a home on agricultural land or condominium property regimes provided there is a recycled manager as described in Section K. Irrigation of single family residential homes without a recycled water manager is prohibited.
- c. Farm Animals: Drinking water for livestock, and poultry with the exception of dairy animals that produce milk for human consumption.
- d. Supply to impoundments:
 - 1) Restricted recreational impoundments such as golf course hazards, landscape water features, fountains, waterfalls;
 - 2) Irrigation storage reservoirs and ponds; and
 - 3) Fish hatchery basins.
- e. Dust control: Dampening, wet sweeping and/or wash-down of streets, roads, parking lots, walkways, etc.;
- f. Cleaning:
 - 1) Flushing toilets, urinals, and sanitary sewers where permitted by the applicable county plumbing code;
 - 2) High pressure water cleaning of surfaces; and
 - 3) Agricultural cleaning to wash down animals such as cattle, livestock, animal pens and housing.
- g. Cooling of power equipment while cutting, coring or drilling pavements, walls and other hard surfaces;

- h. Water jetting to consolidate backfill material around piping for recycled water, non-potable water, sewage, storm drains, gas and electrical conduits;
- i. Washing aggregate and concrete manufacturing;
- j. Boiler feed water;
- k. Industrial processes and industrial cooling;
- l. Cooling in air conditioning systems;
- m. Fire-fighting; and
- n. Test water for gas pipeline testing.

2. R-2 suitable uses:

- a. R-2 subsurface drip irrigation is allowed for:
 - 1) Golf course landscaping;
 - 2) Parks, athletic fields, schoolyards, cemeteries;
 - 3) Above-ground food crops (such as fruit trees) where the edible portion of the crop has minimal contact with the recycled water;
 - 4) Impoundments without fountains or any other water features that generate spray or mist;
 - 5) Landscapes around certain residential property such as condominiums that have a recycled water manager, as provided for in Section K, responsible for the landscape irrigation; and
 - 6) Freeway, roadside, and medial strip landscaping.

- b. R-2 surface drip or subsurface drip irrigation is allowed for:
 - 1) Non-edible vegetation in areas with limited public access;
 - 2) Sod farms;
 - 3) Ornamental plants for commercial use;
 - 4) Fodder, fiber, and seed crops not consumed by humans; and
 - 5) Timber and trees not bearing food crops.

c. Although R-2 spray irrigation is generally prohibited, R-2 spray irrigation may be allowed provided that an adequate buffer exists between the areas being sprayed and the adjacent residential or publicly accessible area. An adequate buffer can be accomplished by:

- 1) Separation distance of 500 feet;
- 2) Physical barrier such as a wall or cliff;
- 3) Tall and dense vegetation; or
- 4) Irrigating with potable water within the buffer area.

3. R-3 suitable uses:

a. R-3 drip or subsurface drip irrigation is allowed for:

- 1) Non-edible vegetation in areas with limited public access;
- 2) Fodder, fiber, and seed crops not consumed by humans; and
- 3) Timber and trees not bearing food crops.

E. Areas Approved for Application

Recycled water shall only be applied (e.g.: sprayed) in approved areas. Areas within the state fall into three categories:

1. **Unrestricted Areas** are areas where recycled water application is unconditionally allowed;
2. **Conditional Areas** are areas where recycled water application is currently allowed, but may, in the future, be subject to monitoring requirements or restrictions; and
3. **Restricted Areas** are areas where recycled water application is prohibited.

Areas designated for approved, conditional and restricted use of recycled water are shown on maps provided in Appendix A1. Designations or requirements may be added or modified in the event that significant events, research studies, or findings warrant change.

For projects to be located in conditional areas, contact the DOH Wastewater Branch for information.

F. Distribution System

1. **Transmission Lines** fall under the jurisdiction of the recycled water purveyor and refer to the piping from the treatment facility to the approved use area, terminating after the service meter box for each approved use area. The meter shall be approved, purchased, and calibrated by the purveyor. The purveyor is also responsible for the quality of the recycled water. Design of new transmission systems shall conform to the "Water System Standards" (State of Hawaii, 2002) and other applicable requirements.
2. **On-Site Distribution Systems** fall under the jurisdiction of the recycled water user and include piping and components downstream of the service meter box for each approved use area. Unless otherwise specified, the user is responsible for maintaining all on-site facilities downstream of the service meter box. Design of on-site distribution systems shall conform to county-adopted plumbing codes and other purveyor requirements.
3. **Cross-Connection and Backflow Provisions** of the *HAR Chapter 11-21 and Backflow Prevention Devices, Water System Standards, Volume I* apply to the recycled water transmission and distributions systems.

G. BMPs – Design and Installation

Best Management Practices (BMPs) refer to the most effective and practicable activities, conduct prohibitions, treatment requirements, schedules, maintenance procedures and other practices to minimize pollution, control runoff, ponding, spills, leaks, sludge or waste disposal, and public contact with recycled water, spray, or mist.

1. Recycled Water System Design

- a. The recycled water irrigation system shall be designed in accordance with good industry standards and practices, these Guidelines, and applicable codes and regulations.
- b. The design must be approved by the DOH. Use or disposal of recycled water for any purpose other than that designated in the approved application submittal is prohibited.
- c. Drinking fountains, picnic tables, barbecues, portable water coolers, and similar items used by the public should be protected from exposure to recycled water or mist.

- d. Controls should prevent direct or indirect runoff from the approved use area to outside areas such as streets, right-of-ways, sidewalks, parking lots, storm drains, gutters, and water bodies such as streams, ponds, and oceans.
- e. Sprinkler heads should be selected with an appropriate spray radius and angle to minimize public exposure to recycled water spray or mist in publicly accessible areas.
- f. Cross-connections of recycled and potable water are prohibited.

2. Backflow Prevention

- a. If an irrigation or water system receives both recycled and potable water, an approved air gap shall be provided for the potable water system. The minimum required air gap shall be two times the potable water discharge pipe diameter but no less than one inch.
- b. If a parcel/project is serviced with both potable and recycled water, and the two systems are not connected to each other, the potable water system shall have a reduced pressure backflow preventer that is approved by the potable water purveyor.

3. Hose Bibs and Hoses

- a. Standard hose bibs in recycled water systems are prohibited.
- b. Secured and color-coded hose bibs requiring a key for access are acceptable.
- c. Quick couplers with locking purple caps that differentiate them from those used on potable water systems are acceptable.
- d. When potable hose bibs are within 60-feet of a recycled water system, appropriate signs shall be posted to differentiate the use of the two.
- e. Hoses used with recycled water systems shall be colored purple (Pantone 512 or equal), tagged or labeled.

4. Recycled Water System Construction

- a. The irrigation shall be constructed in accordance with its approved design and applicable industry standards.
- b. Automatic irrigation controllers should be identified inside and outside of the controller housing in accordance with Section H.
- c. When potable water and recycled water lines are in the same area, identification of potable water mains is recommended. Identification tape using the words "Drinking Water Line" or "Potable Water Line" is acceptable.

H. BMPs – Component Identification

Recycled water system components shall be identified to distinguish them from potable water system components.

1. Components to be Identified

- a. Piping, valves, valve covers, fittings, quick couplers;
- b. Pump exteriors;
- c. Back flow devices;
- d. Manhole covers;
- e. Fire hydrants;
- f. Sprinklers; and
- g. Emitters.

2. Identification Methods

- a. Color Identification: The components listed above should be colored or painted purple (Pantone 512 or equal).



As much as practicable, it is recommended that this color not be used on components that are not part of a recycled water system.

- b. Labeling: If color identification is not feasible, or for other components not listed above (such as meter box covers and controller housings), labeling, stamping, tagging, or tape with the words "Recycled Water," "Recycled Water – Do Not Drink," or similar, is acceptable.
 - 1) Identification tape using black or white letters on a purple background (Pantone 512 or equal) is recommended.
 - 2) Minimum letter height should be one inch. If component size precludes this, letter size should be as large as possible to clearly communicate that recycled water is being used.

I. BMPs – Public Education

Recycled water users must educate and inform the public, workers, and any other persons likely to come into contact with the recycled water, of the potential health hazards arising from ingestion of or contact with recycled water. Recycled water should never be used for human consumption. Hands and other areas of the body that come into contact with recycled water should be washed with soap and potable water.

Recycled water users are responsible for posting warning signs as follows:

- 1. **Content:** Signs shall include both written and pictorial warnings. Wording should indicate:
 - a. Quality of recycled water being used (i.e. R-1, R-2, or R-3);
 - b. What the recycled water is being used for; and
 - c. Appropriate warning.
- 2. **Samples warnings:**
 - a. R-2 RECYCLED WATER USED FOR IRRIGATION. DO NOT DRINK
 - b. R-1 RECYCLED WATER USED FOR DUST CONTROL. DO NOT DRINK. WASH THOROUGHLY WITH SOAP & POTABLE WATER IF CONTACT OCCURS.

3. Location

- a. Signs shall be posted in areas where recycled water is being used, within clear view of the public. Placement shall be along the border of and within the wetted areas which are publicly accessible.
- b. A maximum spacing of 250 feet between signs is recommended.
- c. When recycled water is used in a restricted recreational or landscape impoundment, the impoundment shall have warning signs around its perimeter with pictorial warnings indicating that the recycled water in the impoundment is not safe for drinking, wading, swimming or other bodily contact.
- d. Warning signs shall also be posted on truck tanks and other equipment used to distribute recycled water for purposes such as dust control.

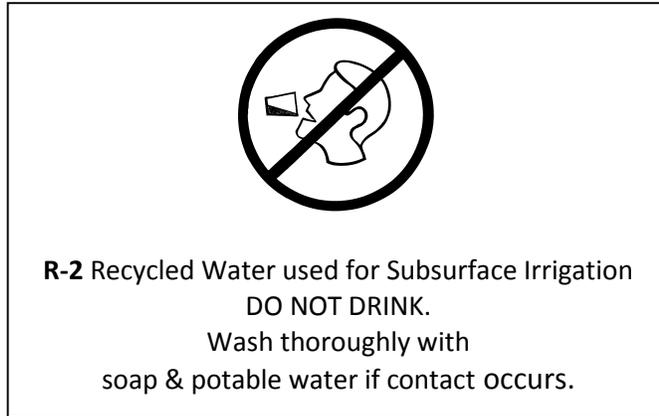
4. Size

- a. Minimum size of signs shall be 11" x 8.5, unless approved by the DOH.
- b. In general, the words and icon should be of sufficient size so that a person 50 feet away is able to read and understand the warning.

5. Samples signs:



b.



c.



J. BMPs – Owner Responsibility

1. **Availability of Potable Water:** Owners/employers of a recycled water distribution system shall provide potable water to workers, in an easily accessible area, for drinking and for washing hands, face, and other body areas that come into contact with recycled water.
2. **Employee Training:** Owners/employers shall provide training to workers who will handle or be exposed to recycled water.
 - a. If the worker's primary language is not English, training should be provided in a language the worker understands.
 - b. Information signs on recycled water should be posted in conspicuous locations with wording of sufficient size to be easily read by workers.

- c. Training and re-training should be done as often as necessary to ensure that workers retain relevant information on recycled water. New employees should be trained as soon as possible.

3. Information for Training: Owners/employers shall inform their workers orally and in writing of the following:

- a. Recycled water is not suitable for drinking because it may contain organisms that cause illness.
- b. Items such as clothing or tools can transport disease-causing organisms.
- c. Employees should wash hands with soap and water before eating, drinking, and smoking, and at the end of the employees' work period.
- d. Employees should not eat or bring food into areas being sprayed with recycled water, areas still wet with recycled water, or areas where recycled water mist is present. In general, employees should avoid being in these areas as much as practicable.
- e. If an employee's hands have come into contact with recycled water, he should keep fingers and hands away from his eyes, nose, and mouth.
- f. If an employee has cuts or breaks in his skin, he should cover these areas with waterproof bandages or other protection before working with recycled water.
- g. If an employee's hands are regularly exposed to recycled water, wearing gloves impermeable to water may be appropriate.
- h. If an employee will regularly be exposed to areas wet with recycled water, wearing shoes or boots may be appropriate.
- i. Employees should prevent and minimize over-spray, runoff and ponding of recycled water. If this is not a part of their job, they should notify the recycled water manager if these conditions exist.
- j. Use of standard hose bibs for recycled water is prohibited.

- k. Method used to identify components in the recycled water system should be explained.
- l. A tour of the purveyor's facility providing the recycled water is recommended to educate employees on the wastewater treatment processes that produce recycled water.

K. BMPs – Operation and Maintenance

BMPs for operation and maintenance help to control runoff, overspray, and minimize the public's exposure to recycled water or mist. Designation of a recycled water manager to oversee the distribution system will help ensure that BMPs are maintained.

1. Application Rate & Schedule

- a. Recycled water should be applied at a rate appropriate to plant uptake and evapotranspiration rates.
- b. Application of recycled water, especially when sprayed in a publicly accessible area, should be scheduled during times when public exposure to recycled water is minimal. (Example: 11 pm - 3 am)
- c. Recycled water irrigation should not occur during rainy periods.

2. Operation

- a. Recycled water application should be regularly examined to prevent excessive application and to determine the appropriate application rate.
- b. Controls should be adjusted and other measures taken to prevent direct or indirect runoff from the approved use area to outside areas such as streets, right-of-ways, sidewalks, parking lots, storm drains, gutters, and water bodies such as streams, ponds, and oceans.
- c. Measures should be taken to minimize public and worker contact with recycled water, spray, or mist. If recycled water spray is contacting areas beyond the approved use area, sprinklers should be adjusted accordingly. If sprinklers or other devices cannot be adjusted to control over spray, a drip irrigation system should be used instead.

- d. The area should be checked for any vector issues arising from the use of recycled water. If recycled water impoundments attract mosquitoes, rodents, or other vectors, a vector control plan should be developed and implemented.
- e. If recycled water is malodorous, notify the recycled water purveyor.

3. Maintenance

- a. The irrigation system should be examined for any maintenance issues; any necessary repairs or maintenance should be performed immediately.
- b. Cross-connection testing should be performed on a regular basis, as appropriate.
- c. If a recycled water spill or leak occurs, areas with large ponding should be pumped to speed the drying process.
- d. Recycled water component identification should be regularly examined and maintained.
 - 1) If purple paint is used for identification, repaint as necessary to ensure system can be easily identified.
 - 2) If labeling is used for identification, maintain labels and replace as necessary to ensure labels are easy to read.
- e. Recycled water public warning signs should be maintained to ensure that they are in satisfactory condition and easy to read.

4. Designation of a Recycled Water Manager

The recycled water user shall designate a Recycled Water Manager to oversee the operation and maintenance of the irrigation system. The manager should have a good working knowledge of the:

- a. Recycled water system and its components;
- b. System installation, operation, maintenance and repair;
- c. Areas approved for application of recycled water; and
- d. Requirements of these *Reuse Guidelines*.

5. **Manager's Responsibilities**

- a. For irrigation projects, the Recycled Water Manager shall:
 - 1) Implement applicable BMPs;
 - 2) Establish an irrigation schedule;
 - 3) Ensure proper system operation in accordance with Section K;
 - 4) Coordinate cross-connection control with the potable water purveyor;
 - 5) Maintain and repair the system as needed;
 - 6) Log maintenance and repair work performed; and
 - 7) Track recycled water use.

- b. For non-irrigation projects, the Recycled Water Manager shall:
 - 1) Implement applicable BMPs;
 - 2) Establish a schedule when recycled water will be used;
 - 3) Ensure proper system operation in accordance with Section K, as applicable;
 - 4) Maintain and repair the system as needed;
 - 5) Log maintenance and repair work performed; and
 - 6) Track recycled water use.

6. **Equipment Cleaning**

Recycled water equipment (such as tanks, temporary piping, temporary valves, and portable pumps) should be cleaned and disinfected before removing the equipment from the approved use area. The Recycled Water Manager should ensure that appropriate cleaning and disinfection processes are completed before subsequent use of the equipment at another site and should be present while cleaning and disinfection occurs.

L. **BMPs – Temporary Recycled Water Use**

- 1. **Temporary Use:** As provided in Section D, R-1 recycled water can be used for temporary projects such as controlling dust at a construction site or flushing a sewer line.

- 2. **Adjacent Areas:** Measures should be taken to ensure that ponding, runoff, and overspray do not occur in areas adjacent to the approved use area.

3. **Warning Labels:** Vehicles and equipment that store, transport, and distribute recycled water (such as truck tanks, hoses, and pumps) should have appropriate warning labels in accordance with Section I.
4. **Leak Prevention:** Vehicle tanks used to transport and distribute recycled water shall have watertight valves and fittings to prevent leakage.
5. **Converting from Recycled to Potable Water Use:** If a truck tank has been used to store recycled water, the tank must be cleaned and disinfected before it can be used to store potable water.
6. **Fire-fighting:** Fire hydrants which use recycled water shall be painted purple in accordance with Section H. Other fire-fighting equipment using recycled water shall be shall be identified using color or labeling in accordance with Section H.

M. Application for a Recycled Water Project

For a recycled water irrigation project in an unrestricted area, an application must be submitted to the DOH Wastewater Branch on forms provided by the Branch.

1. Application Forms

- a. The appropriate form to submit depends on the intended use of the recycled water. The following recycled water application forms are available in Appendix C:
 - 1) General Irrigation
 - 2) Agricultural Irrigation
 - 3) Non-Irrigation Use
 - 4) Temporary R-1 Use
 - 5) Construction Extension

As of the issue date of these Guidelines, current versions of application forms are provided in Appendix C. These forms may be updated as necessary. Check the Wastewater Branch website at <http://health.hawaii.gov/wastewater> or call the office at (808) 586-4294 for the most current form.

- b. Construction plans in accordance with Section M.2 shall be included in the application submittal.

- c. In general, the application submittal should be prepared by an irrigation specialist, licensed landscape architect, licensed engineer, or a licensed architect. However, depending on the type of project, this may vary as follows:
- 1) General Irrigation Project: The application should be prepared by an irrigation specialist, licensed landscape architect, licensed engineer, or a licensed architect.
 - 2) Agricultural Irrigation Project: The application should be prepared by an irrigation specialist, licensed landscape architect, licensed engineer, or a licensed architect. However, if the agricultural area to be irrigated is less than 15 acres, the application may also be prepared by the property owner or recycled water user.
 - 3) For non-irrigation construction use, such as dust control, sewer flushing and high-pressure cleaning, the application should be prepared by a licensed contractor, licensed engineer or licensed architect.
 - 4) For other types of projects not listed, contact the DOH.
- d. The application submittal may be mailed or emailed to the DOH Wastewater Branch. However, construction plans must be submitted in hard copy. If an application submittal is required by an applicable county, the submittal should be approved by the county before it is submitted to the DOH. Submittal instructions are provided on the forms.

2. Construction Plans

The applicant should ensure that submitted plans are legible. For plans that have been reduced in size, a graphic scale should be shown.

- a. **For all projects**, construction plans should provide the following information:
- 1) Area to be irrigated (Color, shade, mark or hatch the area);
 - 2) Names of surrounding properties and/or tax map keys;
 - 3) Names of roads and structures adjacent to irrigated area;
 - 4) Publicly accessible areas;
 - 5) Recycled water system components and method of identification in accordance with Section H;
 - 6) Applicable project notes contained in Appendix B;

- 7) Applicable warning signs in accordance with Section I;
- 8) Recycled water storage reservoirs or impoundments;
- 9) Meter serving as the demarcation between purveyor and user;
- 10) Location of backflow and cross-connection preventers;
- 11) Cross-connection survey/analysis for existing developments converting their irrigation system to use recycled water. The Application Preparer is responsible for ensuring that this is done prior to charging the system with recycled water, and preferably prior to design.

b. **For projects other than agricultural projects**, the following information, (if applicable) should also be provided:

- 12) Distribution lines, pumps, valves, and covers;
- 13) Adequate buffers;
- 14) Recycled water meters, pressure gauges, and sensors;
- 15) Filters;
- 16) Sprinklers; and
- 17) Emitters.

N. Approval Process

1. Approval to Construct

Once the DOH has determined that the application submittal conforms to HAR Title 11, Chapter 62 and these Guidelines, the DOH will issue an *Approval to Construct* to the intended use, with copy to the Application Preparer.

2. Expiration of Approval to Construct

If construction of an approved project is not commenced within two years of the *Approval to Construct* issue date, is stopped for a period of two years or more, or is not completed within a reasonable time, the Approval to Construct will expire with respect to the authorized construction. An approved extension is necessary to extend the *Approval to Construct*; otherwise a new application is required.

3. Approved Extension

If an *Approval to Construct* has expired, the owner may request an extension by submitting a *Construction Extension* form to the DOH. The following information should be included:

- a. Project name and file number;
- b. Reason for the extension;
- c. Estimated date of construction commencement;
- d. Updates or changes to the original application submittal; and
- e. Construction plans that have been modified.

4. Construction Inspections

When the project is completed to the applicant's satisfaction, the applicant shall inspect the project and submit an inspection report to the DOH, along with As-Built plans and an Operation and Maintenance manual.

When the recycled water project is fully operable, the DOH will temporarily allow recycled water start-up while it conducts its inspection.

5. Approval to Use

Once the DOH determines that the project is consistent with the application submittal, HAR Chapter 62 and these Guidelines, the DOH will issue an *Approval to Use* to the recycled water user, with copy to the Application Preparer and recycled water purveyor.

6. Operation & Maintenance Inspections

The DOH may periodically conduct operation and maintenance inspections of the recycled water system, including storage impoundments, distribution system, and area where the recycled water is being applied. The DOH may also request and examine any applicable records such as the volume of recycled water used.

O. Converting from Recycled to Potable Water Use

If a water distribution system for recycled water is later intended to distribute potable water, system disinfection shall conform to the potable water purveyor's requirements.

1. Intent to Convert

Prior to system disinfection, the purveyor shall send a letter of intent to the DOH. The letter should identify the purveyor's contact who will certify that the distribution system meets the purveyor's potable use requirements. The letter should include:

- a. Purveyor's name;
- b. Contact's name;
- c. Street address;
- d. Tax Map Key;
- e. Phone number;
- f. Email address;
- g. Description of the conversion and disinfection process;
- h. Estimated date for purveyor's certification; and
- i. Estimated completion date of conversion.

2. Conversion Notification

The purveyor should notify the DOH in writing once system conversion has been completed.

3. Color Identification

Component color identification or labels indicating use of recycled water in the system should be removed.

P. Updates to Application and Reporting Forms

As of the issue date of these Guidelines, current forms are provided in the Appendix C. Since forms may be updated from time to time, check the Wastewater Branch website at <http://health.hawaii.gov/wastewater> or contact the office at (808) 586-4294 for the most current form.

Appendix A1: Recycled Water Use Maps

Recycled water use maps designate areas where the use of recycled water is restricted, conditional, or unrestricted. Although most areas allow for unrestricted recycled water use, certain sensitive areas that may be potentially impacted by recycled water use are subject to notification and monitoring requirements.

Figures 1 through 6 provide maps of the main Hawaiian Islands (Oahu, Maui, Hawaii Island, Kauai, Molokai and Lanai). Restricted areas are shown in red, conditional areas in yellow and unrestricted areas in green.

A. Restricted Areas

1. Restricted areas are as follows:

- a. Areas within the Zone B capture zone delineation (CZD) for public drinking water sources that draw water from a shaft excavated along the surface of the water table where groundwater travel to the shaft is two years or less.
- b. Areas within a 1,000 foot radius of zones designated as Ground Water under the Direct Influence (GWDUI) of surface water (also a Zone B CZD).
- c. Areas within 1,000 feet of wetlands, ponds or enclosed bays that fall within a designated reserve or protected conservation district.

2. Restricted areas are subject to the following requirements:

- a. Notification of agencies or entities, such as drinking water purveyors or protected conservation district or reserve managers, involved with or connected to the potentially impacted area.
- b. Chemical analysis of designated constituents in the effluent recycled water for treatment plants supplying more 10,000 gallons per day.
- c. Hydro-geologic study to predict the impact of recycled water.
- d. Possible soil or ground water monitoring based on the results of the items 2 and 3 above.

Appendix A1: Recycled Water Use Maps

B. Conditional Areas

1. Conditional areas are as follows:

- a. All public drinking water CZDs;
- b. Designated reserves; and
- c. Protected conservation districts, excluding those specifically designated under *Restricted Areas*.

2. Conditional areas are subject to the following requirements:

- a. Notification of agencies or entities, such as drinking water purveyors or protected conservation district or reserve managers, involved with or connected to the potentially impacted area.
- b. Chemical analysis of designated constituents in the effluent recycled water for treatment plants supplying more 10,000 gallons per day.

C. Unrestricted Areas

Unrestricted areas are shaded in green and include all areas not designated as *Restricted* or *Conditional*.

Additional details concerning requirements for *Restricted* or *Conditional Areas* will follow in Appendix A.2, to be provided at a later date. For current applications to use recycled water over a restricted or conditional area, contact the DOH.

Appendix A1: Recycled Water Use Maps

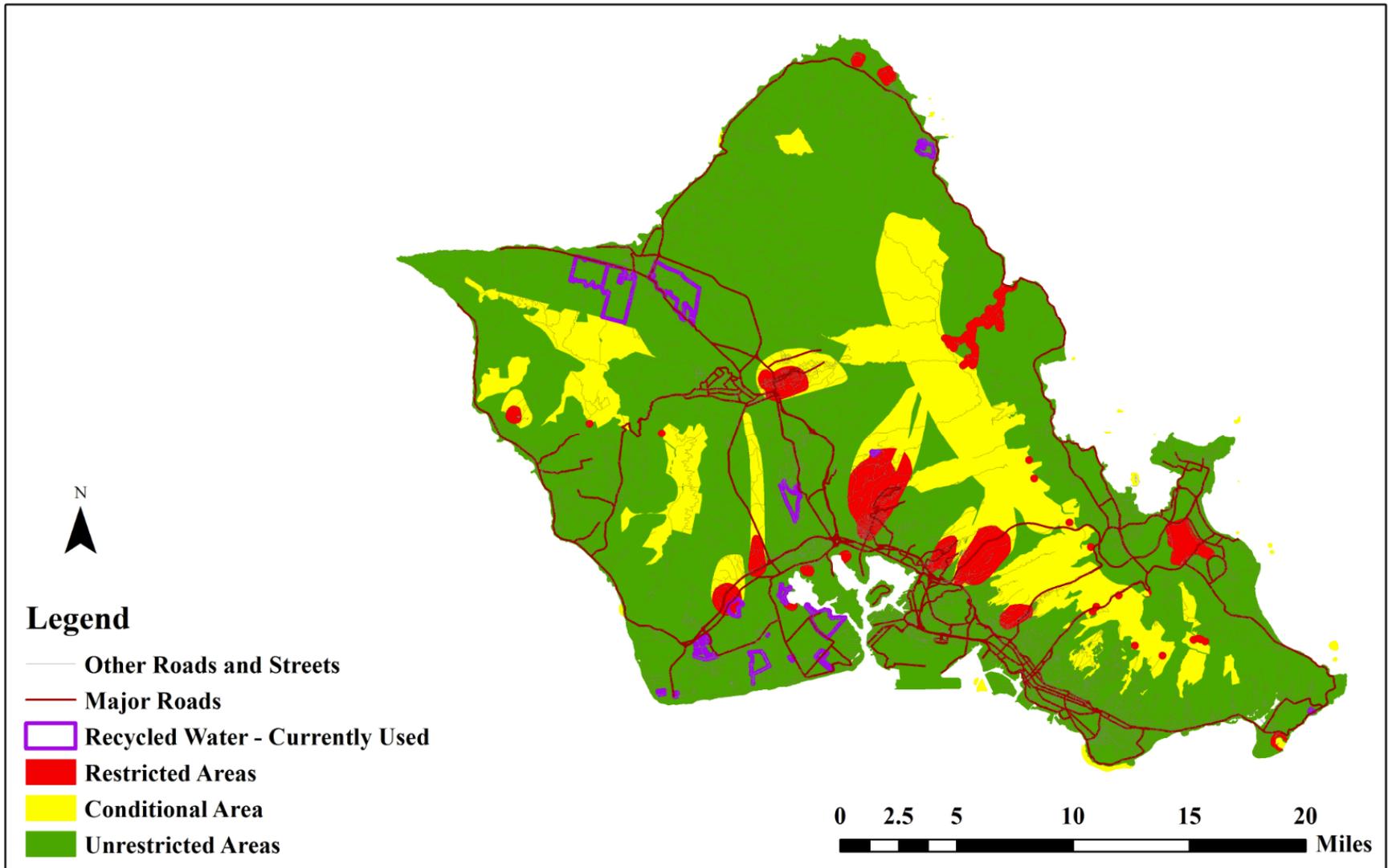


Figure 1. Oahu

Appendix A1: Recycled Water Use Maps

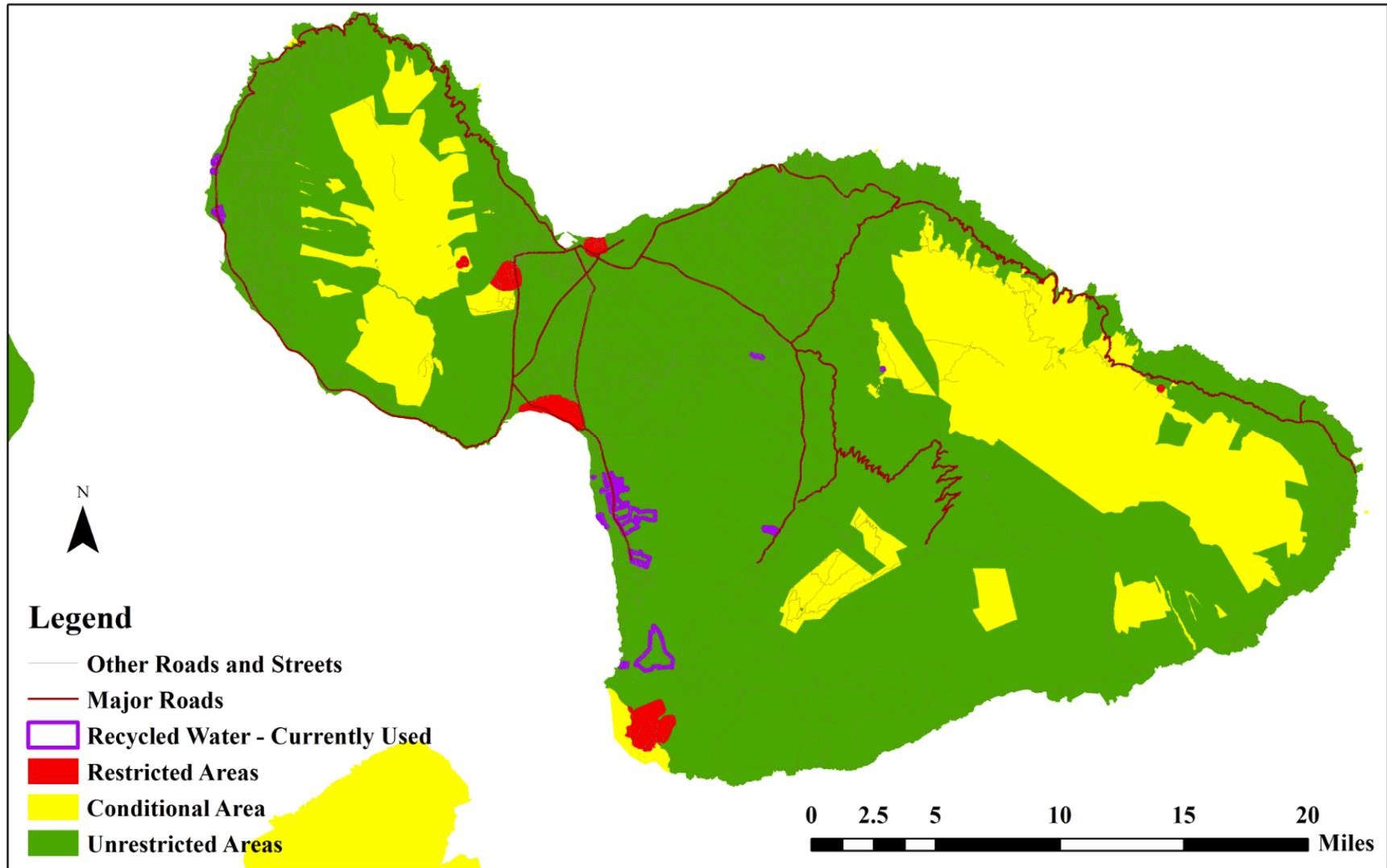


Figure 2. Maui

Appendix A1: Recycled Water Use Maps

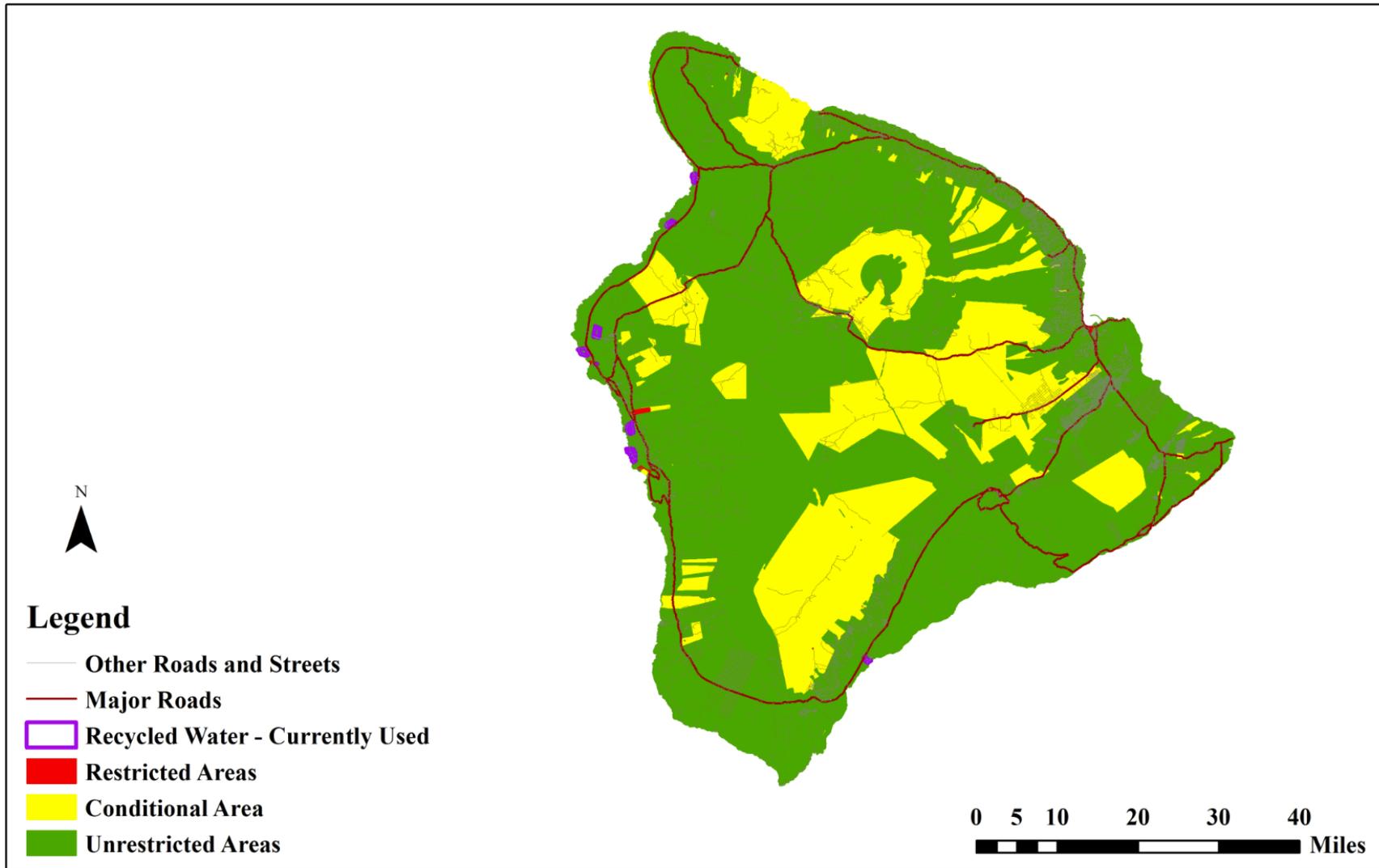


Figure 3. Hawaii Island

Appendix A1: Recycled Water Use Maps

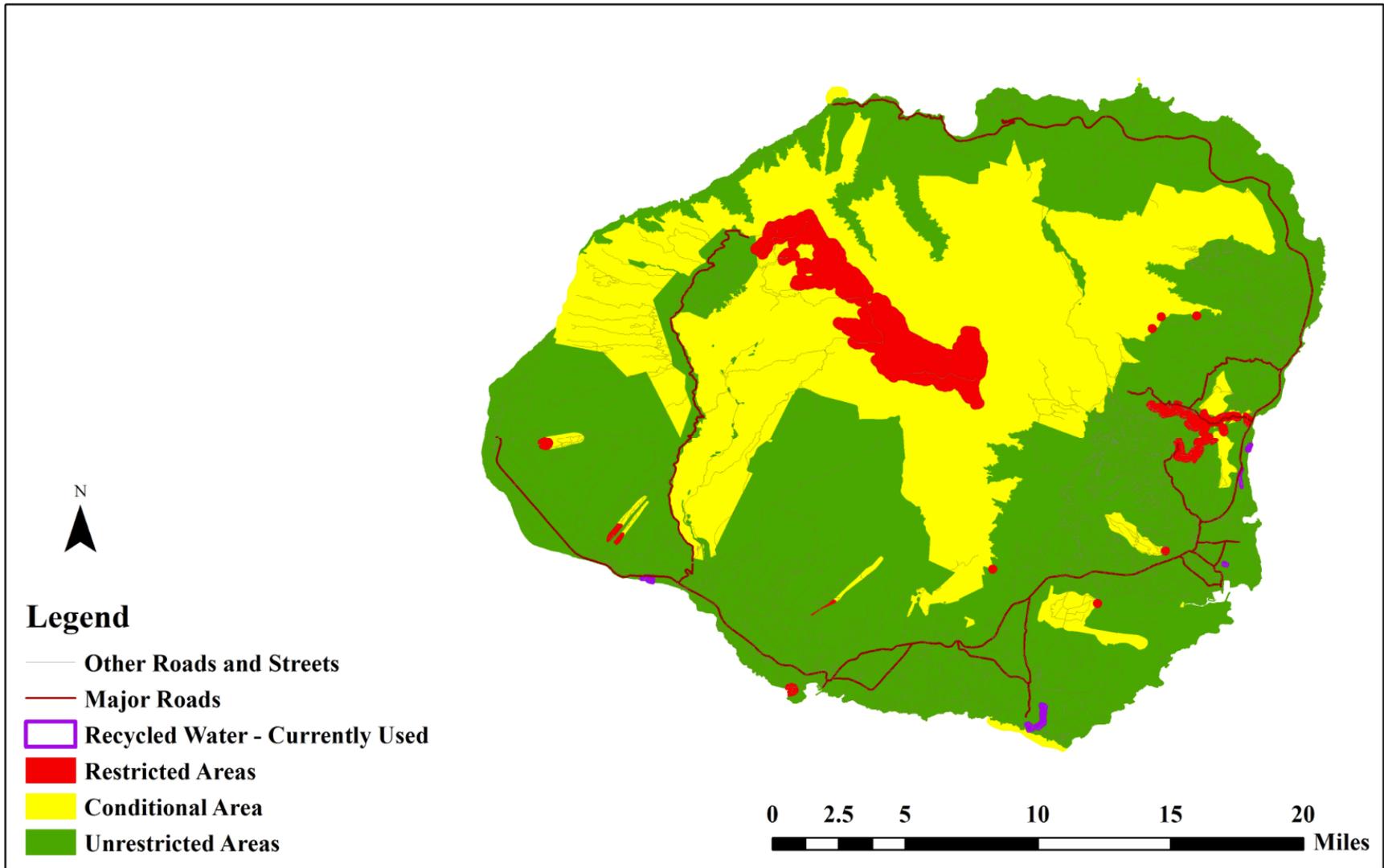


Figure 4. Kauai

Appendix A1: Recycled Water Use Maps

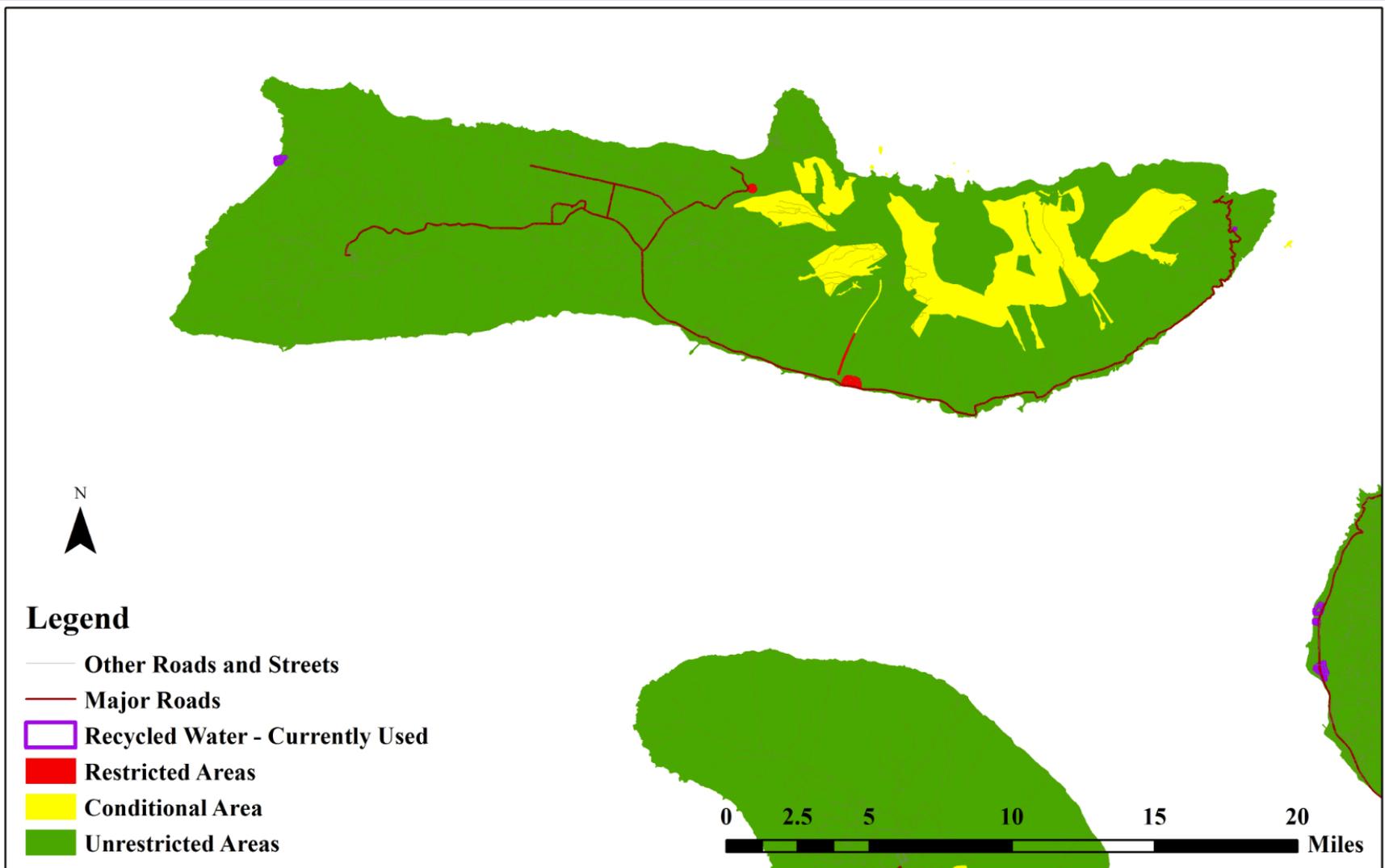


Figure 5. Molokai

Appendix A1: Recycled Water Use Maps

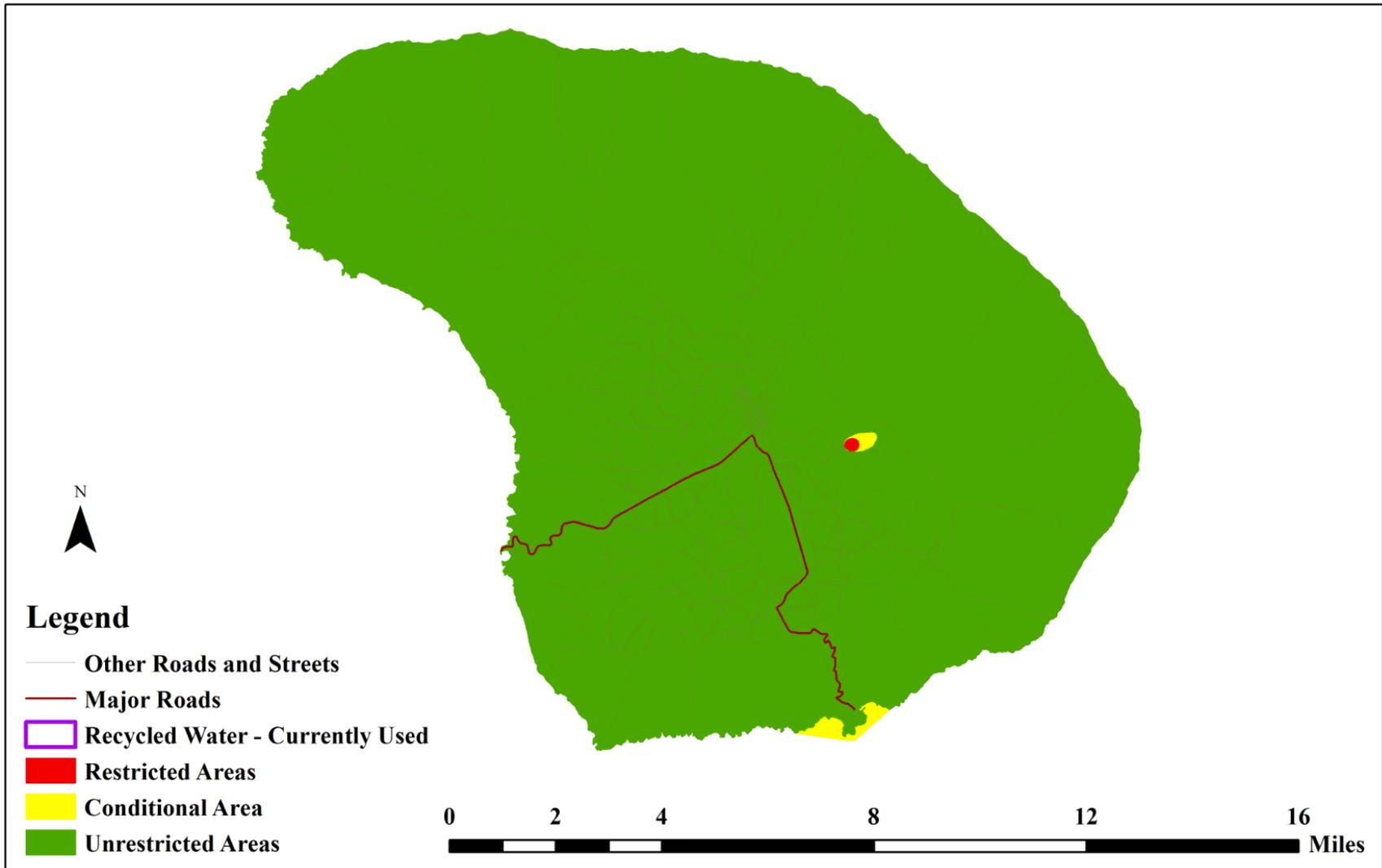


Figure 6. Lanai

Appendix B: Recycled Water Project Notes

1. **Standards:** Horizontal and vertical clearances between potable water, utility and recycled water lines, minimum easement or right-of-way distances, minimum cover and other requirements for non-potable lines shall conform to the "Water System Standards" Department of Water, County of Kauai; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; Department of Water Supply, County of Hawaii; Volume 1 [26], county-adopted plumbing code, as amended, and other water purveyor requirements.
2. **Color Identification:** Recycled water system components, including the following, shall be colored or painted purple (Pantone 512 or equal): piping; valves; valve covers; fittings; quick couplers; pump exteriors; back flow devices; manhole covers; fire hydrants; sprinklers; and emitters. As much as practicable, it is recommended that this color not be used on components that are not part of a recycled water system.
3. **Labeling:** If color identification is not feasible, or for other components not listed above (such as meter box covers and controller housings), labeling, stamping, tagging, or tape with the words "Recycled Water," "Recycled Water – Do Not Drink," or similar, is acceptable.
 - a. Identification tape using black or white letters on a purple background (Pantone 512 or equal) is recommended.
 - b. Minimum letter height should be one inch. If component size precludes this, letter size should be as large as possible to clearly communicate that recycled water is being used.
4. **Signage:** To caution the public when recycled water is being used, signs with appropriate verbiage, recycled water quality, and pictorial icon shall be posted, as provided in the construction plans and/or details.

Appendix C: Recycled Water Application Forms

1. General Irrigation
2. Agricultural Irrigation
3. Non-Irrigation Use
4. Temporary R-1 Use
5. Construction Extension

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: GENERAL IRRIGATION

A. APPLICANT INFORMATION

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

B. PROJECT INFORMATION

Project:	Property Owner's Name:
Site Description or Address:	Property Owner's Street, City, State & Zip Code:
	Property Owner's Phone Number:
Project Tax Map Key:	Property Owner's Email Address:

C. WASTEWATER RECLAMATION FACILITY (WWRF) SUPPLYING RECYCLED WATER

WWRF:	Recycled Water Quality: <input type="checkbox"/> R-1 <input type="checkbox"/> R-2 <input type="checkbox"/> R-3
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D. IRRIGATION PLAN Include construction plans in accordance with Reuse Guidelines, Vol. 2, Section M.

Irrigated Area (acres):	Estimated Water Use (gpd):
Area Designation: Refer to Reuse Guidelines, Vol.2, App. A1 & https://health.hawaii.gov/epo/egis/ <input type="checkbox"/> Unrestricted <input type="checkbox"/> Conditional <input type="checkbox"/> Restricted	
Irrigation Schedule to Minimize Public Contact with Recycled Water (eg: M, W, F: 11 p.m. – 3 a.m.):	
Irrigation Methods to be used (eg: spray, surface drip, subsurface, combination, etc.):	
Methods to minimize public/worker contact with recycled water or mist:	

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: GENERAL IRRIGATION

E. FOR R-2 ONLY: If spray irrigation of R-2 is proposed, describe provisions for an adequate buffer.

F. **RECYCLED WATER MANAGER (responsible for implementing best management practices)**

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

G. **APPLICATION PREPARER (irrigation specialist, licensed architect, landscape architect, or licensed engineer)**

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

H. **RESPONSIBLE OFFICIAL'S CERTIFICATION (owner's representative)**

I certify that the information provided is true and complete to the best of my knowledge and belief; that applicable BMPs will be implemented; and that compliance with *HAR, Chapter 11-21, Backflow Prevention Devices; Water System Standards, Volume I*; and *Owner Responsibility* (Section J of the Guidelines) will be maintained.

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:
Signature:	Date:

I. **APPLICATION SUBMITTAL**

1. Submit application via mail or email.
2. Submit electronic file of construction plans and provide hard copy. Include information per section M of *Volume 2: Recycled Water Projects*, available at <http://health.hawaii.gov/wastewater/home/reuse/>
3. Mail to: State Of Hawaii, Waste Water Branch, 2827 Waimano Home Rd #207, Pearl City, HI 96782
or Email: april.matsumura@doh.hawaii.gov

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: AGRICULTURAL IRRIGATION

A. APPLICANT INFORMATION

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

B. PROJECT INFORMATION

Project:	Property Owner's Name:
Site Description or Address:	Property Owner's Street, City, State & Zip Code:
	Property Owner's Phone Number:
Project Tax Map Key:	Property Owner's Email Address:

C. WASTEWATER RECLAMATION FACILITY (WWRF) SUPPLYING RECYCLED WATER

WWRF:	Recycled Water Quality: <input type="checkbox"/> R-1 <input type="checkbox"/> R-2 <input type="checkbox"/> R-3
-------	---

D. IRRIGATION PLAN Include construction plans in accordance with Reuse Guidelines, Vol. 2, Section M.

Irrigated Area (acres):	Estimated Water Use (gpd):
Area Designation: Refer to Reuse Guidelines, Vol.2, App. A1 & https://health.hawaii.gov/epo/egis/ <input type="checkbox"/> Unrestricted <input type="checkbox"/> Conditional <input type="checkbox"/> Restricted	
List crops to be grown. Crops irrigated with R-3 may not be used for human consumption.	
Irrigation Methods to be used (eg: spray, surface drip, subsurface, combination, etc.):	
Methods to minimize public/worker contact with recycled water or mist:	

E. FOR R-2 ONLY: If spray irrigation of R-2 is proposed, describe provisions for an adequate buffer.

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: AGRICULTURAL IRRIGATION

F. RECYCLED WATER MANAGER (responsible for implementing best management practices)

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

G. APPLICATION PREPARER (irrigation specialist, licensed architect, landscape architect, or licensed engineer)

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

H. RESPONSIBLE OFFICIAL'S CERTIFICATION (owner's representative)

I certify that the information provided is true and complete to the best of my knowledge and belief; that applicable BMPs will be implemented; and that compliance with *HAR, Chapter 11-21, Backflow Prevention Devices; Water System Standards, Volume I; and Owner Responsibility* (Section J of the Guidelines) will be maintained.

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:
Signature:	Date:

I. APPLICATION SUBMITTAL

1. Submit application via mail or email.
2. Submit electronic file of construction plans and provide hard copy. Include information per section M of *Volume 2: Recycled Water Projects*, available at <http://health.hawaii.gov/wastewater/home/reuse/>
3. Mail to: State Of Hawaii, Waste Water Branch, 2827 Waimano Home Rd #207, Pearl City, HI 96782
or
Email: april.matsumura@doh.hawaii.gov

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: NON-IRRIGATION USE

A. APPLICANT INFORMATION

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

B. PROJECT INFORMATION

Project:	Property Owner's Name:
Site Description or Address:	Property Owner's Street, City, State & Zip Code:
	Property Owner's Phone Number:
Project Tax Map Key:	Property Owner's Email Address:

C. WASTEWATER RECLAMATION FACILITY (WWRF) SUPPLYING RECYCLED WATER

WWRF:	Recycled Water Quality: <input type="checkbox"/> R-1 <input type="checkbox"/> R-2 <input type="checkbox"/> R-3
-------	---

D. PLANNED USE: If applicable, include construction plans in accordance with Reuse Guidelines, Vol. 2, Section M.

Describe use of recycled water:

Estimated Water Use (gpd):

Methods to minimize public/worker contact with recycled water or mist:

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: NON-IRRIGATION USE

E. RECYCLED WATER MANAGER (responsible for implementing best management practices)

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

F. APPLICATION PREPARER

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

G. RESPONSIBLE OFFICIAL'S CERTIFICATION (owner's representative)

I certify that the information provided is true and complete to the best of my knowledge and belief; that applicable BMPs will be implemented; and that compliance with *HAR, Chapter 11-21, Backflow Prevention Devices; Water System Standards, Volume I; and Owner Responsibility* (Section J of the Guidelines) will be maintained.

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:
Signature:	Date:

H. APPLICATION SUBMITTAL

1. Submit application via mail or email.
2. Submit electronic file of construction plans and provide hard copy. Include information per section M of *Volume 2: Recycled Water Projects*, available at <http://health.hawaii.gov/wastewater/home/reuse/>
3. Mail to: State Of Hawaii, Waste Water Branch, 2827 Waimano Home Rd #207, Pearl City, HI 96782 or Email: april.matsumura@doh.hawaii.gov

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: TEMPORARY R-1 USE

A. APPLICANT INFORMATION

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

B. PROJECT INFORMATION

Project:	Property Owner's Name:
Site Description or Address:	Property Owner's Street, City, State & Zip Code:
	Property Owner's Phone Number:
Project Tax Map Key:	Property Owner's Email Address:

C. WASTEWATER RECLAMATION FACILITY SUPPLYING R-1 RECYCLED WATER

D. R-1 USE (Select below)

- Dust control
- Temporary irrigation & erosion stabilization
- Sewer line flushing
- Sewer line pressure testing
- Other – Describe:

E. PERIOD OF USE

Start date:	End date:
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Methods to minimize public or worker contact with recycled water or mist:

F. FOR TEMPORARY R-1 IRRIGATION: Include plans in accordance with Reuse Guidelines, Vol. 2, Section M or attach map showing areas where R-1 to be used and names of surrounding properties, roads and structures.

Irrigated Area (acres):	Estimated Water Use (gpd):
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Area Designation: Refer to Reuse Guidelines, Vol.2, App. A1 & <https://health.hawaii.gov/epo/egis/>

Unrestricted Conditional Restricted

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: TEMPORARY R-1 USE

Irrigation Methods to be used (eg: spray, surface drip, subsurface, combination, etc.):

G. RECYCLED WATER MANAGER (responsible for implementing best management practices)

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

H. APPLICATION PREPARER (irrigation specialist, licensed architect, landscape architect, or licensed engineer)

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:

I. RESPONSIBLE OFFICIAL'S CERTIFICATION (owner's representative)

I certify that the information provided is true and complete to the best of my knowledge and belief; that applicable BMPs will be implemented; and that compliance with *HAR, Chapter 11-21, Backflow Prevention Devices; Water System Standards, Volume I; and Owner Responsibility* (Section J of the Guidelines) will be maintained.

Name:	Street, City, State & Zip Code:
Title:	Phone Number:
Company:	Email Address:
Signature:	Date:

J. APPLICATION SUBMITTAL

1. Submit application via mail or email.
2. Submit electronic file of construction plans and provide hard copy. Include information per section M of *Volume 2: Recycled Water Projects*, available at <http://health.hawaii.gov/wastewater/home/reuse/>
3. Mail to: State Of Hawaii, Waste Water Branch, 2827 Waimano Home Rd #207, Pearl City, HI 96782
or Email: april.matsumura@doh.hawaii.gov

STATE OF HAWAII DEPARTMENT OF HEALTH WASTERWATER BRANCH
RECYCLED WATER APPLICATION FORM: CONSTRUCTION EXTENSION

A. APPLICANT INFORMATION

Name:	Street, City & Zip Code:
Title:	Phone Number:
Company:	Email Address:

B. PROJECT INFORMATION

Project:	File number :
Site Description or Address:	

C. CONSTRUCTION EXTENSION

Revised estimated start date:

Reason for Extension:

D. DESCRIBE CHANGES TO ORIGINAL APPLICATION. Attach relevant documents.

E. APPLICATION PREPARER:

Name:	Street, City & Zip Code:
Title:	Phone Number:
Company:	Email Address:
Signature & Date:	

F. APPLICATION SUBMITTAL

1. Submit application form via mail, email or both.
2. Submit electronic file of construction plans, as well as a hard copy. Include information per section M of *Vol II: Recycled Water Projects*.
3. Mail to: State Of Hawaii, Waste Water Branch, 2827 Waimano Home Road #207, Pearl City, HI 96782
Email: april.matsumura@doh.hawaii.gov